

I/WE CLAIM:

1. A casing-engaging wellhead isolation tool, comprising:

a mandrel that is stroked through the wellhead; and

a releasable packer assembly connected to a bottom end of the mandrel, the releasable packer assembly being settable in a set position in which packer slips grip the casing when the wellhead isolation tool is stroked through the wellhead to a set position, to transfer lift pressure induced by well stimulation fluids to the casing, so that wellhead components to which the wellhead isolation tool is mounted are not subjected to lift pressures that could exceed a holding or tensile strength of any component of the wellhead.
2. The casing-engaging wellhead isolation tool as claimed in claim 1 further comprising a setting tool for stroking the mandrel through the wellhead.
3. The casing-engaging wellhead isolation tool as claimed in claim 2 wherein the wellhead isolation tool comprises a sealed chamber through which the mandrel reciprocates, the sealed chamber having an adjustable length to permit the mandrel to be locked in the set position.
4. The casing-engaging wellhead isolation tool as claimed in claim 3 wherein the sealed chamber comprises:

a first hollow cylinder having a bottom end that is mounted to a top of the wellhead and an open top end;

a second hollow cylinder having an open bottom end that receives the top end of the first cylinder and a closed top end that houses a high-pressure packing through which the mandrel reciprocates; and

a high-pressure fluid seal disposed between an inner wall of the second cylinder and an outer wall of the first cylinder, the high pressure fluid seal permitting the second cylinder to be moved upwardly and downwardly over the first cylinder within predetermined upper and lower limits without loss of fluid containment within the sealed chamber.

5. The casing-engaging wellhead isolation tool as claimed in claim 4 wherein the outer wall of the first cylinder further comprises a smooth cylindrical upper region which the high-pressure fluid seal contacts and a spiral-threaded lower region having an elongated pin thread engaged by a box thread of a hollow lock flange disposed on the lower region of the first cylinder.

6. The casing-engaging wellhead isolation tool as claimed in claim 5 wherein the outer wall of the second cylinder further comprises a annular shoulder on a bottom end thereof, the annular shoulder supporting a lockdown nut having a box thread that engages a pin thread on an outer surface of the

hollow lock flange disposed on the lower region of the first cylinder.

7. The casing-engaging wellhead isolation tool as claimed in claim 6 wherein the top end of the second cylinder comprises an interchangeable seal adaptor that is secured to a top end of an outer wall of the second cylinder, the interchangeable seal adaptor housing the high-pressure packing through which the mandrel reciprocates, to permit selection of a mandrel having a diameter best suited to a diameter of a casing of a well to be stimulated using the wellhead isolation tool.
8. The casing-engaging wellhead isolation tool as claimed in claim 7 wherein the interchangeable seal adaptor is secured to the second cylinder by a threaded union.
9. The casing-engaging wellhead isolation tool as claimed in claim 8 wherein the interchangeable seal adaptor further comprises a pin-threaded annular top end that is engaged by a box-threaded lockdown nut supported by an annular flange on a bottom end of a mandrel adaptor mounted to a top end of the mandrel, the lockdown nut removably locking the mandrel adaptor to the top of the sealed chamber.
10. The casing-engaging wellhead isolation tool as claimed in claim 9 wherein the mandrel adaptor further comprises a top flange to which a high pressure valve is mounted to control fluid flow through the mandrel.

11. The casing-engaging wellhead isolation tool as claimed in claim 10 further comprising a mandrel insertion adaptor connected to a top of the high pressure valve.
12. The casing-engaging wellhead isolation tool as claimed in claim 11 further comprising first and second hydraulic cylinders for reciprocating the mandrel, the first and second hydraulic cylinders being respectively connected on one end to support arms on opposed sides of the mandrel insertion adaptor, and respectively connected on an opposite end to support arms affixed to opposed sides of a bottom end of the first cylinder.
13. The casing-engaging wellhead isolation tool as claimed in claim 12 wherein the cylinder ends of the hydraulic cylinders are removably connected to the support arms affixed to opposed sides of a bottom end of the first cylinder.
14. The casing-engaging wellhead isolation tool as claimed in claim 13 further comprising an adaptor pin for connecting the wellhead isolation tool to a top of the wellhead, the adaptor pin having pin-threaded top and bottom ends, the pin-threaded top end being adapted to engage a box thread in a bottom end of the first cylinder and the pin-threaded bottom end being adapted to engage a box thread in a top end of the wellhead.
15. A method of isolating a wellhead prior to pumping high pressure well stimulation fluids into a casing of a well, comprising:

stroking a mandrel through the wellhead, the mandrel having a bottom end to which a casing packer is affixed; and

setting the casing packer in the casing to transfer to the casing lift pressure induced by well stimulation fluids on the mandrel, so that wellhead components to which the wellhead isolation tool is mounted are not subjected to lift pressures that exceed a tensile strength of any component of the wellhead.

16. The method as claimed in claim 15 wherein the step of stroking the mandrel through the wellhead comprises:
mounting a wellhead isolation tool to the wellhead comprising a setting tool for stroking the mandrel through the wellhead.
17. The method as claimed in claim 16 further comprising stroking the mandrel through a sealed chamber having an adjustable length to permit the mandrel to be locked in a set position in which the casing packer is set.
18. The method as claimed in claim 17 further comprising:
locking a top end of the mandrel to a top end of the sealed chamber after the casing packer is stroked into the casing; and
applying lifting pressure to the mandrel to move the mandrel and a second cylinder of the sealed chamber upwardly to a set position in which the casing packer is set in the casing.
19. The method as claimed in claim 4 further comprising:

rotating a hollow lock flange disposed on a pin-threaded lower region of a first cylinder of the sealed chamber to move the lock flange upward into contact with a bottom end of the second cylinder; and

rotating a lockdown nut having a box thread that engages a pin thread on an outer surface of the lock flange, the lockdown nut being supported by an annular flange on a bottom end of the second cylinder to lock the second cylinder and the mandrel in the set position.

20. The method as claimed in claim 19 wherein prior to stroking the mandrel through the wellhead, the method comprises:

selecting a mandrel having a diameter best suited to a diameter of the casing;

selecting a corresponding mandrel adaptor;

selecting a corresponding interchangeable seal adaptor and mounting the interchangeable seal adaptor to the top of the second cylinder;

inserting the mandrel through a high-pressure packing in the top of the interchangeable seal adaptor; and

connecting a top end of the mandrel to a bottom end of the mandrel adaptor.

21. The method as claimed in claim 20 further comprising securing the mandrel adaptor to the top end of the second cylinder using a threaded union.

22. The method as claimed in claim 21 further comprising mounting a high pressure valve to a top of the mandrel adaptor to control fluid flow through the mandrel.
23. The method as claimed in claim 22 further comprising mounting a mandrel insertion adaptor to a top of the high pressure valve.
24. The method as claimed in claim 23 further comprising connecting first and second hydraulic cylinders for reciprocating the mandrel to support arms affixed to opposite sides of the mandrel insertion adaptor and to opposite sides of a bottom end of the first cylinder.
25. The method as claimed in claim 24 further comprising removing the hydraulic cylinders and the mandrel insertion adaptor from the wellhead isolation tool after the mandrel is locked in the set position.
26. The method as claimed in claim 13 further comprising installing an adaptor pin to connect the wellhead isolation tool to a top of the wellhead, the adaptor pin having pin-threaded top and bottom ends, the pin-threaded top end being adapted to engage a box thread in a bottom end of the first cylinder and the pin-threaded bottom end being adapted to engage a box thread in a top end of the wellhead.